AUDECIBEL

MAY 1953
VOL. II NO. 2

JOURNAL OF THE SOCIETY OF HEARING AID AUDIOLOGISTS

TRANSISTOR NEWS!

IMPORTANT SALES FEATURES OF THE MICROTONE TRANSI-MATIC MODEL T1

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The second quarterly issue, which normally would have been the April issue, has been published in May in order to include in it information and the tentative program of the Society's annual meeting, July 26, 27, 28 & 29.

In This Issue

APRIL 1953

Newsletter 3
Events and news of general interest

Is Your House In Order? 4
An Editorial *by Grover C. Coil*

Letters to the Editors 6

Education and Instruction 8
Part two of a discussion of audiometry *by Andy Harvey*
A discussion of Speech Audiometry *by J. L. Utley, Jr.*
Children and Wearable Hearing Aids, *by Catherine L. Fogle*

Certification Quiz 12
Questions applicants should study before taking the certification test

The Ear and Noise 13
An article on industrial deafness *by Howard P. House, M.D.*

This official journal of the Society of Hearing Aid Audiologists will carry to the medical specialist in the field of hearing a continuing report of what dealers are doing to improve standards and ethics.

Papers are solicited from otologists and others in the field of audiology and allied fields. Published quarterly, the subscription charge is $3.00 per year in the U.S.A. Canadian and foreign, $4.00 per year.

The Society of Hearing Aid Audiologists reserves the right to edit or reject any manuscripts submitted for publication.

All manuscripts submitted must be signed by the author. All photographs, charts or diagrams accompanying such articles remain the property of this publication.

In event of contests the decision of the editorial staff will be final and no entries will be returned.

Recipients of the journal should notify their postmaster and the publisher one month before any change of address is to take effect. Both old and new addresses should be given.

All communications should be addressed to The Society of Hearing Aid Audiologists, Suite 1209, 6 North Michigan Avenue, Chicago 2, Illinois. Telephone STate 2-6859. Advertising rates will be furnished on request.

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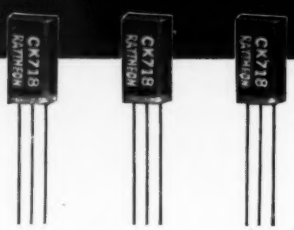

Figure it out for yourself

All-Transistor Hearing Aids employing *three* RAYTHEON Transistors combine the factors of dependable performance and extra convenience with savings in operating cost that are destined to multiply the use of hearing aids many times over.

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This feature of this journal is designed to keep you informed on current significant developments in the hearing aid industry and on significant happenings to individuals. Address contributions to *The Editor*, Suite 1209, 6 North Michigan Avenue, Chicago 2, Illinois.

Newsletter

Jury Votes $51,000 to Engineer Made Deaf By Accident

Verdict for $51,000 against the Milwaukee Railroad in favor of John L. Jobe, 61, of Ottumwa, Ia., an engineer for the road, was returned by a jury before Judge Harry H. Porter in Evanston City court recently. Jobe was injured Feb. 18, 1951, when a defective lubricator backed up and blew hot oil in his face while he was operating a freight engine at Sewal, Ia. The blast of hot oil caused Jobe to fall and hit his head, destroying the hearing in his right ear, according to testimony at the trial. Jobe's attorney, Robert Martineau, said that his client, who had been employed by the road for 38 years, is unable to continue as an engineer because of his deafness.

Association Membership Pays

An article in The Kipplinger Magazine of July, 1951 carries the following interesting paragraph among others. "Your trade association membership card puts you on the inside of an outfit dedicated to helping you make more money out of your business. It can pay dividends hundreds of times greater than the price of your membership. It works this way. For each big problem facing the industry, the association sets up a committee to seek solutions. The committee is made up of men who have met the problem successfully or who have ideas on how to lick it. Whenever you are up against a tough problem, holler for help . . . and remember: Help is no good unless you use it."

An Obituary

Mrs. John H. Heinsman died March 30, 1953. Mr Heinsman's many friends in Michigan, where he has been a dealer since 1944, extend their condolences.

F.T.C. Issues Decision Against "Miracle Hearing Aid" March 11, 1953

Advertising claims that "Miracle Hearing Aid" (1) enables persons with complete loss of hearing to hear; (2) that its use improves the hearing of persons with impaired hearing, or (3) that it is of any value as a hearing aid, must be discontinued under terms of an initial decision issued by Hearing Examiner John Lewis against Miracle Hearing Aid, Inc., and Ruth Miller, 587 Main St., East Orange, N. J., the Federal Trade Commission announced recently. The respondents are also ordered to stop advertising (1) that physicians have approved the device, and (2) that the initial cost of the device is the only cost to the purchaser. They are further ordered to stop using the words "Hearing Aid" as a part of their corporate or trade name, and failing to reveal in advertising that the device may result in serious injury to the auditory canal and ear drum.

Du Pont Replaces Clock with Honor System

Some 1800 employees at the Electro-Chemical division of E. I. du Pont de Nemours & Co., Inc., will file their own time slips at the end of each week, reporting to management the number of hours they have worked. According to Ross Hare, plant manager, tossing out the time-honored time-clock system and substituting "the individual's own conscience," was decided upon at a meeting of the plant committee, composed of employee and management representatives. Mr. Hare believes the move has far-reaching implications in the field of human relations. "It is," he said, "the substitution of freedom of action and individualism in place of regimentation."

The Twenty-fifth Annual Observance of National Hearing Week Will Be May 3rd to 9th

National Carbon Company announces an increase in the price of the "Eveready" No. 1002E hearing-aid "A" battery. Effective April 1 the suggested retail price will be $0.35 each, an increase of five cents. The P. R. Mallory Company also announced price increases on their entire line of "A" batteries.

Name Beltone Hearing Aid Distributors

Several new distributors of Beltone hearing aids have been appointed recently, according to an announcement from David H. Barnow, general sales manager for the Beltone Hearing Aid Company. Those appointed include August C. Barthman, Green Bay, Wis.; H. Philip Kessler, Champaign, Ill.; John L. Mason, Clarksburg, W. Va.; Raymond C. Fischer, Sr., Abilene, Texas; Rubein V. Johnson, Atlanta, Ga.; Peter J. Janis, Paducah, Ky., and Morris Abrams, San Bernardino, Cal. The Beltone Hearing Aid Company has also announced that its new plant and general office is nearing completion in Chicago. Covering 30,000 square feet, the $400,000 structure will include two sound-proof testing rooms built without any rigid connections to the rest of the building.

IHAA's Gwen Marries

The bride wore pink or 'sumpin'—and the groom introduced a new polka dot collar. Anyway, it was a wonderful wedding and you should have been there when IHAA's Gwen married Ray-O-Vac's Walter.

Andy Harvey Recovering from Surgery

Andy Harvey telephoned recently advising us that he is well on the road to recovery from his recent surgery. In fact, he is making better progress than his physicians had anticipated. He expressed thanks to all of those wonderful friends who have written encouraging notes to him and wants them to know how happy he was to receive them. It will be impossible now to answer them all individually, but someday, when he is able, he expects to do so. In the meantime, he hopes that this will serve as an expression of his appreciation.

Grover C. Coil

Is Your House In Order?

by Grover C. Coil, Executive Director, Society of Hearing Aid Audiologists

GROWTH in the hearing aids industry has been persistent, though at intervals interrupted by temporary upsets of varying lengths. After a decline, the total business has always moved up to a new high.

The industry shall continue to grow because of these irrefutable facts: increase in the number of hearing handicapped persons; product improvement increasing availability to greater numbers of the hard of hearing; improvement of personnel at retail level; greater competency due to educational advancement in the fitting and servicing of hearing aids; greater confidence on the part of the buying public, inspired by the elevation of ethical standards at all levels; economic adjustments in distribution methods and procedures.

Continued progress may be expected in the future, even though it may not be possible at present to outline the exact form or importance of particular developments. Production research and aggressive marketing contribute importantly to keeping our industry stable.

A forward looking market analysis, must take into account the dynamic aspect of free enterprise, and while in the midst of such developments it is not possible to see their full fruition and impact.

Significant is the aspect of the economic growth which new enterprises and broadened uses of many already developed products make to the expansion of sales markets and employment.

The hearing aid business in recent years has concentrated to an unusual degree in developing and marketing many outstanding improvements, the result of industrial research and product development, while according to the United States Chamber of Commerce, American industry, in toto, cannot be considered as rapidly growing.

In the hearing aid industry new products and improvements of old products have been announced with increasing frequency. This engineering aggressiveness has contributed importantly to keeping the industry in a vigorous position.

These efforts have in most instances returned substantial benefits to the firms and the hard-of-hearing public. Our fast growing industry has an opportunity to create a significant economic impact, providing the elements within the industry itself will fuse their common interests and make a consolidated approach to the problem of expanding their common markets. It is significant that prior to this time in this important industry there has been little combined forward-looking market analysis, education and development. The undisclosed and undeveloped market expansion potential is enormous and **now** is the time for a forward-looking market development by our dynamic, free enterprise industry.

Significant shifts in the scope of new phases cannot always be accurately evaluated by what meets the eye, no more so than can the amount of timber that can be cut from a forest be accurately surveyed by casually walking through the edge of the woods.

Many now in the industry remember the simple carbon transmitter-type hearing aid. The introduction of the amplified carbon set was belittled by the cynics who pointed out that it was not a true amplifier but only a "Booster," and that it would be too noisy. In a relatively short time, those objections and objectors were forgotten, then came new sales highs, better hearing aids, more sales people.

The advent of the vacuum tube hearing aids caused a recession in sales of carbon instruments and not until the industry had overcome the effects of the "They won't work" boys and settled down to the problems of ironing out the "bugs" and producing standard, high-quality vacuum tube sets, did sales charts get back on the upgrade. Again, greater numbers of aids were sold, employment increased at all levels, **benefits** increased to the public and to the industry at all levels, and there followed a period of quickened expansion that in the aggregate had never been anticipated, except possibly by a few.

In every period of our experience, the emergence of new products and improvements has been followed by a period of fast growing development opening up new opportunities and benefits not previously foreseen. No exception to the above was the introduction of the printed circuit and the one piece hearing aid. This period too had its "Doubting Thomases," its "It-won't-work" boys, the same production drag, the same sales decline, the same technological rebirth, and then the entire industry was released to another cycle of rapid expansion.

New growth tendencies respond to pent up energies, new distribution records were established and as industry development continued **greater benefits** again were available to the public and at all levels of the industry, only being tempered by the growing need for ethical and educational advancement at the retail level and a growing need for an organization to propagate information and to develop competent, responsible personnel to serve properly the increasing public demand for properly fitted instruments.

If the growth tendencies and response of business fluctuations were analyzed in mathematical detail, the

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To buy one of these instruments is, moreover, to get far more than the last word in hearing aid quality and efficiency. Each one is scientifically fitted by a qualified consultant using Beltone's own electronic methods to provide maximum availability of the instrument's inherent capacity. There are 144 different fittings of power, gain and tonal response. Maintenance of initial efficiency is assured, moreover, by a highly organized service program, unexcelled in the hearing aid industry.

Whenever a hearing aid is indicated, therefore, to recommend a Beltone is to insure maximum hearing satisfaction even for the very hard of hearing. Write today for complete information or see the Beltone distributor listed in your telephone directory.

Beltone

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Individually Fitted—Personally Serviced

BELTONE HEARING AID COMPANY, 1450 W. 19th ST., CHICAGO 8, ILL.

general characteristics outlined above would be found to be an accurate portrayal of the past. Now we have TRANSISTORS, and another major disturbance with all of the same factors experienced in previous cycles to greater or lesser degree. For some considerable time the application of transistors to hearing aids has seemed inevitable. Some hearing aid manufacturers prepared earlier than others. Some are still on the doubtful side. Given time, as in the past, engineering design, production skill and improvements will surmount all major obstacles. In the interim, the same old inertia has developed, the same old pressures are being felt at all levels. Production is down. Sales are down, there is much talk, much fear.

Be Ye Not Afraid. Your industry always has met and always will meet every challenge of advancement that confronts it! The hearing aid industry is off now to a new, unparalleled upward swing to heights heretofore unattained. GREATER ACCOMPLISHMENTS! GREATER BENEFITS FOR ALL!

The industry is ready to expand momentarily. How about you? **Are you ready** for the greatest expansion period in industry history beyond your greatest hopes? Again we caution you, are *you* ready? Is your house in order? What are you doing about gaining more information, becoming more competent to serve more people, **more discriminating** people?

You are not doing all you can unless you support the International Hearing Aid Association and participate in the educational and ethical advancement of your fellows in the SOCIETY OF HEARING AID AUDIOLOGISTS.

When you do these things, have no fear, for your fondest dreams will be exceeded, providing you continue to be dynamic in your practice of the art of personal persuasion. Don't wait, but with atomic energy, catapult yourself and your organization wholeheartedly into preparing for your participation in this, the greatest market your industry has ever experienced.

Letters to the Editors

Dear Sirs:

I have just completed reading the January AUDECIBEL. This is it! We wish thanks to be given to each and every one of you for the great work you are doing. This is the answer to all our problems and a very great help to the consultants as well as the dealers.

H. E. B.
California

●

Gentlemen:

We enjoy reading the AUDECIBEL very much; it is both interesting and informative. It's amazing how many customers and prospects are interested in our Certification Diplomas. They add a note of professional authority to our work, that is very helpful. Certainly, your program is assisting the good hearing aid dealer to attain his rightful place in public esteem.

G. F. R.
New York

●

Sirs:

I am particularly interested in the formation of this society. It would be appreciated if all literature concerning registration, etc., could be sent to me by return post.

W. v d S.
Johannesburg, South Africa

●

Dear Sirs:

I have appreciated receiving your magazine and especially enjoyed the article on audiometry and hope that you will continue to have articles on that subject, even though they may repeat what has been taught in the classes, and also seem elementary at times.

E.L., M.D.

●

Sirs:

In reading through the January, 1953, issue of "Audecibel," I noted that the first quiz for certification for hearing aid audiologists was to be published in the April, 1953, issue. In the past it has been a source of inspiration to read about the activities of your Society. It is a fine thing to know that persons who furnish hearing aids to the public will soon be known as "Hearing Aid Audiologists," rather than "Hearing Aid Salesmen." Your Society's efforts in raising the standards of technical personnel who handle hearing aids is indeed commendable.

E.A.P., M.D.

Copies of the Journal containing the certification list have been requested by the people listed below and many individuals.

Social Service Department of The Jamaica Hospital, Jamaica, Long Island, N. Y.,

The Jewish Vocational Service of Greater Boston,

Southern California Hearing Council,

Oregon State Board of Health,

Boston Guild for the Hard of Hearing,

Audiometric Technician, Seattle Public Schools.

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W-1 & W-2 (Spondaic) Threshold Measurements (V. A. #7205)
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Wherever men of medicine look to electro-acoustic science, you'll find the Maico Man. At work—*behind the scenes!*

Silently, unobtrusively—he answers your call when the very young patient needs special auditory training equipment for use in the home; when you must be assured of integrity in the custom-fitting of a precision hearing aid to meet the individual needs of your patient; when your practice demands the most exacting in advanced auditory testing and training equipment.

He stands ready when it's time for your Maico Precision Audiometer to go back to the Maico Laboratories for periodic recalibration and inspection. He makes all arrangements; he frees you from all detail. His is a career of service to hearing science. His services—*as available as your office telephone.*

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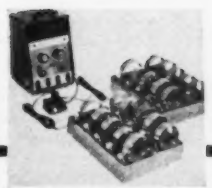

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Education and Instruction

Part II of a discussion of audiometry for the June class of candidates for certification led by Andy Harvey.

SPEECH audiometry is the most definite and specific means at present available to us for the evaluation of the usefulness of the patient's residual hearing, just as pure tone audiometry is the method of choice for determining its amount, and character.

There are a number of speech tests for us to consider. In all of them the audiologist should endeavor to keep his voice at a consistent level and his mouth at a uniform distance from the microphone.

The whisper test is primarily useful in determining perception, the ability to interpret speech when sufficiently amplified. With the mouth about two inches from the microphone, whisper with breath exhaled. Set the attenuator (the volume control calibrated in decibels) at a sufficiently loud level for the patient to understand, and then turn it down by gradual steps to the lowest point at which he can repeat simple sentences or place names. This point is the "whisper level" for that ear. The impressions of an experienced audiologist are significant in evaluating a whisper test. Did the patient understand easily or as a result of effort and intelligence? Is understanding easier in one ear than the other, even though gross hearing may be more or less equal? If so, that is the ear to fit. If, as sometimes happens, particularly in the case of elderly people, the whispered voice cannot be understood at all, it is a danger signal. The patient is unlikely to be able to hear at a distance with a hearing aid and will have trouble in other situations requiring good perception, even though he may get along well in conversation with a single individual.

In spoken voice tests the audiologist should also keep his voice at a constant level. This should be checked on the speech meter, if one is available. Three points should be determined for each ear:

1. The L.C.L. or lowest conversational level; this is the amount of amplification at which the patient can repeat approximately half of what the operator says.
2. The M.C.L. or most comfortable level—the point at which the patient hears with the greatest ease, comfort and certainty.
3. The T.D. or threshold of discomfort—this is the amplification level at which pain or tickle begins.

From these tests come several important findings. The margin between the L.C.L. and the T.D. gives the R.C.L. or range of comfortable loudness. If this be very narrow (5 to 20 decibels) recruitment is rapid and you are dealing with nerve deafness. These are the cases for whom the instrument is always "too loud" or "not loud enough"—never just right. In fitting, it is therefore desirable to provide as slow a rate of power increase on the volume control as is possible.

The M.C.L. will indicate how powerful a fitting is needed, which model, which receiver and what "B" battery voltage. It also helps in choosing the ear to fit, and in selecting the type of ear mold to be used.

The T.D. is an indication of the level at which "peak clipping" or compression should become effective. It is also helpful in determining the type of loss and the probable prognosis for hearing at a distance. A high T.D. (100, or greater than the audiometer output) usually indicates a conductive lesion. If this be combined with an M.C.L. of 50-70, and whisper understanding, distance hearing should be good.

In recent years, based on the Harvard work and others, we have started to do Social Adequacy testing. With the sound raised to a comfortable level for the patient, as determined by a spondee word test, one of the 50 word P.B. lists is read. These are the "phonetically balanced" lists prepared at Harvard, each of which is supposed to contain all of the normal sounds in the English language. These lists, when prepared, were deemed of equal difficulty so that they could be used indiscriminately for checking and rechecking and while further study has indicated slight differences, the general premise holds good. As the audiologist reads the words, the patient repeats them. For each word repeated incorrectly, two points are deducted from one hundred. The remainder, after the entire list is read, is plotted as the ordinate on a chart, with the number of D.B.'s of amplification required plotted as the abscissa. The intersection of the two lines, according to a predetermined formula, indicates the Social Adequacy Index.

The figure resulting from this P.B. test may be compared with one arrived at by the same method but without amplification as a measure of the improvement in Social Adequacy likely to be obtained by the use of a hearing aid. At a later time, after the instrument has been fitted, a further check can be made by doing a Social Adequacy test with the patient wearing his own hearing aid.

The procedures which I have outlined will, taken together, provide a fairly complete picture of the patient's ability to assimilate and interpret speech. Throughout the testing the impressions of the experienced audiologist are of great importance. The type and speed of the patient's reactions, his degree of alertness, and his demonstrated intelligence level all tell a story to the practiced technician. In this, as in so much else, it is one thing to learn the methods and another to interpret the results. For the latter, there is no substitute for experience.

I have covered this as a practical application of speech audiometry in fitting a hearing aid. I have not gone into clinical situations.

Andy B. Harvey has been a practicing hearing aid audiologist in Albany, New York for the past 12 years.

FOR CERTIFIED HEARING AID AUDIOLOGISTS ONLY

Solid gold ornamental lapel pin with rich blue enamel. Price **$5.00**, by registered mail prepaid.

Actual size one-half inch by five-eighth inch.

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SOCIETY OF HEARING AID AUDIOLOGISTS
6 North Michigan Avenue **Chicago 2, Illinois**

Speech Audiometry

Its practical aspects in the fitting of hearing aids, by J. L. Utley, Jr.

HOW successful are you in fitting a 20 db loss of hearing? A slight loss is often more difficult to fit than a moderate or severe loss. If you pass up opportunities to fit persons with slight losses, you are passing up sales. More than that, you are not completely fulfilling your obligation to the public—to help them to hear better when help is needed.

More and more people with slight losses of hearing are being attracted to hearing aids because of their smaller size, greater acceptability, and more efficient performance. Since a large proportion of the people with moderate and severe losses have already investigated hearing aids, a large part of our new business will come from people with slight or moderate losses. There are more slight losses than moderate losses, and more moderate losses than severe losses. We are going to be working more and more with the slight losses of hearing. This being true, the Speech Audiometer will play an increasingly important part in fitting hearing aids.

Just a few years back, the fitting of hearing aids was a relatively simple matter. One hearing aid, three or four different receivers, some tone and sensitivity adjustments and several different battery arrangements made up the fitting possibilities. Today some makes of hearing aids have as many as twelve or fifteen different receivers, five or more different amplifiers with several different efficiencies possible in each amplifier by changing the components. All this is in addition to the tone and sensitivity adjustments regularly found on hearing aids. As many as 200 to 400 or more different fitting combinations are possible with some amplifiers.

You can see that where twelve receivers take the place of three or four there is less difference between them. In order to select the one best suited to an individual, more accuracy in determining the fitting components is necessary, additional fitting equipment has become needed, and the Speech Audiometer will meet this need.

The Speech Audiometer will prove helpful in all fitting work, but it will prove the most helpful in fitting people with slight losses. In general, the slighter the loss of hearing, the greater the need for accuracy in the testing and fitting.

The individual who sits across the demonstration desk and has no apparent difficulty in hearing you, but says he does not hear at lodge, or church, etc., is difficult to fit and difficult to demonstrate to. If, however, you can show him with a work test, on which you can control the amplification a decibel at a time, just where he falls short, or just how much more the hearing aid gives him, you have a chance to interest him and help him with an aid.

Proper use of the Speech Audiometer can save time in your demonstration because the results are clear cut. When there is doubt about the selection of the components in the mind of the prospect it delays the demonstration.

It should not be necessary to point out that an examination by an otologist or, at least, an otoscopic examination should be made prior to any audiometric examination. Impacted cerumen, for example, could account for all of the hearing difficulty of a person with a 20 db hearing loss.

The Speech Audiometer tests most generally used in fitting work are as follows:

1. Hearing loss for speech unaided—free field. This word test is made with the loudspeaker. The person being tested wears no hearing aid. He sits in front of the speaker with both ears open. The result gives you his hearing loss for conversational speech expressed in decibels.

2. Hearing loss for speech unaided—headphones. This test is made with the headphones, one ear at a time. Otherwise it is the same as test No. 1. It is more accurate than the free field test, and can be given to a person with a severe loss when a free field test is not practical.

3. Discrimination test—free field—unaided. This test shows the individual's ability to understand conversational speech.

4. Discrimination test—headphones. As with the hearing-loss-for-speech test it gives the same result as the free field test but it checks one ear at a time. It is best to use this test on a person with a hearing loss greater than it is practical to check in free field.

5. Determination of which ear should be fitted. This can usually be done by simply making the hearing-loss-for-speech unaided—headphones test on each ear and choosing the better ear. Sometimes the discrimination of one ear will be better than the other. If there is any question, the discrimination test can be made on both ears and the better one determined.

6. Hearing loss for speech aided—free field—to determine which hearing aid component gives the best result. Simply rerun the hearing-loss-for-speech—free field test with the different fitting possibilities and find the combination that gives the closest to normal result.

7. Determination of the social-adequancy index. No further testing is necessary; the results of the hearing-loss-for-speech test and the discrimination test are used on the index chart. Determine the index before fitting the hearing aid and after, and note how much improvement there is.

You can see that to run all these tests on each individual would take a great amount of time. You can also see that there is no need to run all the tests on most individuals.

Since you are most interested in just how a person hears under ordinary conversational conditions you use the free field tests as much as possible. The headphone tests are used for testing individual ears, or when a great amount of amplification is required.

The test for hearing loss for speech—free field—unaided, is one of the most useful tests. It shows both you and the prospect just what trouble he has. Since persons with similar hearing conditions often react differently to spoken words, it will show you many things the pure tone test can not show.

The discrimination tests are quite lengthy and we have not found them necessary in most of our fittings unless difficulty is apparent or unless the individual is dissatisfied with the results he is able to get with his hearing aid. The hearing aid, of course, does not improve a person's discrimination. It makes sounds louder, and thus easier to hear. By showing a person what his discrimination loss is without any aid, you can show him just what limitation there is in his hearing condition. Very often it is hard for a person to realize there are limitations to his hearing condition. It is helpful to him, and to you, if you can show him what they are.

If there are any questions about which ear to fit the aid to for best results, simply run the hearing-loss-for-speech test with the headphones on each ear and determine which is better. If there is a difference in discrimination evident you can easily check this if you desire. Ordinarily the word tests and talk-back circuit on the audiometer will make it quite clear just which ear will give better results with the aid.

In selecting the hearing aid components you will know before you start the speech tests just what components should give the best results. Use the tests to verify your conclusions. Remember that many of the fittings will work out much differently than you expect. The Speech Audiometer is the only way to bring these differences to light. What sounds best may not be best.

The social-adequacy index is of little importance in the fitting. You are giving the best result possible with a given hearing condition and as long as it is the best, the social-adequacy is, therefore, not important. However, the chart may make it easier to explain the individual's hearing condition to him, and the social-adequacy index may be of interest to the referring physician or to a school or vocation rehabilitation adviser.

The following typical fitting routine has been worked out in our office: 1. Determine hearing loss for speech, unaided, free field. 2. Air and bone conduction pure tone tests of both ears. 3. Discrimination test if necessary. 4. Free field tests—aided—to select the hearing aid components to best suit the particular hearing condition.

The Speech Audiometer is important fitting equipment, particularly in the slight loss cases. In order to use it successfully you must understand thoroughly the various fitting possibilities of the hearing aid you are fitting as well as the tests it is possible to make with the Speech Audiometer.

J. L. Utley, Jr., B.S., is a graduate of Tulane University, is a member of the Society of H.A.A., and has been a practicing hearing aid audiologist since 1947 in Cleveland, Ohio.

Children and Wearable Hearing Aids

by Catherine L. Fogle, graduate of Northwestern University, assistant professor of Audiology, University of Illinois College of Medicine, Eye & Ear Clinic

THE literature pertaining to the use of wearable hearing aids has been chiefly concerned with the hearing impaired adult. This is due to the fact that only within comparatively recent years has the attention of persons engaged in hearing rehabilitation been directed toward the child's use of a wearable hearing aid. The impetus to this area of aural rehabilitation has primarily resulted from the increased development of hearing conservation programs in the school systems, research work being done in diagnostic and rehabilitation centers in colleges and universities, and the improved wearability and efficiency of the modern-day hearing aid.

Various estimates have been made regarding the number of hearing handicapped school children in the United States. Silverman[1] has estimated that there are from 1,500,000 to 2,000,000 children of school age in the United States who have defective hearing. This is approximately 5% to 7% of the total. In a report by Gardner[2] published in 1950 as a result of hearing tests on one-third of the public school population it was felt that the incidence of 4% would be a fair indication of hearing impairment. Marcus[3] has reported that as a result of the Chicago Hearing Conservation Program, 2.5% of the public school population tested were found to have a hearing loss of 30 decibels or more, in more than one frequency in either ear. Because of the wide variance in these figures, it becomes obvious that there is a need for more consistent and definite standards if an accurate nationwide figure is to be obtained. A fair number of these children will fortunately respond to otological treatment and will not require amplification. Others will have hearing losses of such slight degree that amplification will not be indicated. However, it is reasonable to assume, and experience has borne out the fact that there are a considerable number of children who have irreversible hearing losses of such degree that amplification is a necessity. It is with the latter group that this article is concerned.

Considerable controversy has existed regarding the optimum time for children with varying degrees of hearing impairment to commence using wearable hearing aids. As a result of the studies being done in aural diagnostic and rehabiiitation centers, answers to some of the controversial issues are beginning to evolve. As work in this area proceeds, it becomes increasingly evident that each child must be considered an individual. Each has his own potentialities and limitations. He is first of all a child, and secondly, he is a child with a hearing impairment. Because each child is different, not only in type, degree and duration of hearing impairment, but also in emotional, physical and intellectual structure, it is difficult to draw up a set of standards for recommending wearable hearing aids. However, there are a few general issues which should be discussed with the hope that some useful information may be forthcoming. After reviewing the area, it appears that the following are some of the more pressing questions at the present time:

1. How much residual hearing should a child have in order to use a wearable hearing aid advantageously,
2. How great must a hearing loss be before the need for amplification is indicated,
3. Is the age of the child a factor to be considered in recommending a wearable hearing aid,
4. What are some other important factors in a child's adjustment to a wearable hearing aid, and what precautionary measures can be taken to foster a satisfactory adjustment?

1. HOW MUCH RESIDUAL HEARING SHOULD A CHILD HAVE IN ORDER TO USE A WEARABLE HEARING AID ADVANTAGEOUSLY?

Generally speaking, the child should have developed an awareness of sound through hearing and some desire to hear. Deaf children with losses of approximately 80 decibels, or greater, usually require a period of auditory training under professional guidance before the value of amplification can be determined. During this training period, a non-wearable type aid should be used. The reason for this type of equipment is obvious. If after a reasonable trial period the child displays no interest in whatever stimulation he is receiving aurally, he should not be further induced to "listen." If such a trial period is extended too long for these children, they may become extremely sensitive about their inability to hear and tend to develop feelings of inadequacy which only accentuate the handicap.

On the other hand, if a so-called deaf child develops a listening attitude and a real desire to hear, he should be given sufficient amount of training with a non-wearable unit and then be fitted with a wearable hearing aid. Not all children in this category will be able to hear to the same degree. Some may only develop the ability to differentiate accent and rhythm patterns of speech. Some may exhibit more hearing and be able to hear a few, or all, of the vowel sounds. Others may, in addition, be able to hear some of the more forceful consonant sounds. These children will never be able to hear speech in its entirety, but will hear speech only partially. Nevertheless, this degree of hearing is of inestimable value in the development of more normal speech and language. It is our studied opinion that for this group of children, wearable hearing aids should only be fitted upon the recommendation of professional persons with sufficient experience in this particular phase of aural rehabilitation.

2. HOW GREAT MUST A HEARING LOSS BE BEFORE THE NEED FOR AMPLIFICATION IS INDICATED?

In reviewing the literature, the general consensus seems to be that amplification is usually not required unless the

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person has a loss for speech in the better ear of 35 db. or greater. In many instances, this does not hold true for the child who is in school. Often a child with as little as 25 decibel loss for speech is experiencing considerable difficulty in hearing in the classroom. We know of no life situation which demands better hearing than that required in an academic situation. Preferential seating does not alleviate the condition in every instance, and when the hearing situation cannot be relieved in this manner a wearable hearing aid should be recommended. Borderline cases require considerable investigation and thought. The child's ability to hear in varied situations should be studied and carefully evaluated before a final decision has been reached. The family, the school authorities, and other associates if possible should be questioned regarding the child's reactions in various hearing situations. This is a time consuming process, but one which is most necessary for effective rehabilitation.

A comment regarding preferential seating for a child with a hearing impairment should be made at this time. A child with a hearing loss should always have preferential seating in the classroom even though he may be wearing a hearing aid. It is usually best not to seat the child in the first row, but preferably in the second or even third row from the front of the classroom. Such placement will give him an opportunity to observe the reactions of the children seated in front of him and thereby receive clues as to the progression of class activities. In addition, such seating is less obvious than front row placement which would tend to further accentuate the handicap.

The condition of the child's vision is of importance. Any person with a hearing impairment should be given a complete ophthalmological examination. If a visual defect is present, correction should be made insofar as possible. Recommendations for seating and therapy, such as speech reading, may necessarily be altered depending upon the degree of visual handicap and the extent to which correction is possible.

3. IS THE AGE OF THE CHILD A FACTOR TO BE CONSIDERED IN RECOMMENDING A WEARABLE HEARING AID?

A child should not be fitted with a wearable hearing aid until it has been possible to obtain a fairly accurate assessment of the degree of the loss. This would preclude putting hearing aids on "babes in arms" as has been done in some instances. At this early age it is impossible to determine accurately the degree of hearing impairment, and it is often difficult to determine whether the reduced response to the aural stimulus is due to peripheral or to central nervous system changes, i.e., so-called brain injury.

Successful experiences with wearable hearing aids have been obtained with youngsters of approximately three years of age. Naturally, a standard pure tone audiometric test cannot be administered at this age. In most instances accurate audiometric test results cannot be obtained until a child is approximately 5 or 6 years old. Other fairly reliable measurements of hearing can be employed with younger children. The most widely used methods for testing the very young child are those of freefield voice and speech sounds, noise makers, freefield pure tone, speech reception thresholds, electroencephalography, and the psychogalvanic skin resistance technique. It is not wise to recommend a wearable aid unless the child shows a fairly consistent response to the majority of these tests, and in addition has shown some ability to hear speech, although perhaps to a limited degree. This does not mean that he must be able to interpret a large vocabulary of words or hear connected discourse.

Children of this age who have had successful experience with wearable hearing aids have had losses as great as 70 decibels. If a hearing loss of such degree has existed since birth, the child will not have developed speech and language to a degree even approximating normalcy. But experience has shown that great impetus has been given to speech and language development through continual use of amplification which is afforded only by wearing a hearing aid. Such children may become "hard of hearing" in the course of time and no longer need to be classified as deaf children. It is possible that by the age of 5 or 6 years the child may have developed speech and language sufficiently to enter a regular school with hearing children.

The best adjustments to wearable aids are made by children in the age range between 3 and 7 years. Unfortunately, fittings of wearable hearing aids are often delayed too long and are attempted at a time in the child's life when he is very resistant to the idea. The adolescent child usually presents the greatest difficulty. His life is one continual round of problems and the addition of a hearing aid is more than he can tolerate. It is seldom that an adolescent makes a satisfactory adjustment to a hearing aid. Many of them simply refuse to wear an instrument at all. This area of aural rehabilitation is in need of continued and extensive research. If hearing aids were fitted at an earlier age, the problems of the hearing impaired adolescent should be somewhat alleviated.

4. WHAT ARE SOME OTHER IMPORTANT FACTORS IN A CHILD'S ADJUSTMENT TO A WEARABLE HEARING AID AND WHAT PRECAUTIONARY MEASURES CAN BE TAKEN TO FOSTER A SATISFACTORY ADJUSTMENT?

A good medical diagnosis is of the utmost importance in the rehabilitation of the hearing impaired individual. Its importance in dealing with children cannot be overemphasized. Rehabilitative procedures, with possibly the eventual fitting of a hearing aid, cannot proceed with any degree of satisfaction until a diagnosis has been established and accepted insofar as possible. With young children, it is the parents who must accept the diagnosis.

By means of a careful otological assessment of the status of the individual's hearing, factors may be found which militate against maximum success with amplification. Due to the cause and effect of the hearing loss, problems of tolerance to amplified sound may be suspected. It may also be found that the hearing loss is not stabilized because of the type of recency of the pathology. The history and examination may reveal indications that the loss is not peripheral but of central origin as mentioned earlier in this article. Some children may appear to be deaf who, in reality, are not deaf, but are unable to respond to sound normally. When such cases are suspected, it is often necessary to enlist the services of other specialities before a diagnosis can be established. These additional specialities may include a psychologist, a psychiatrist, an audiologist, an educator, and a social worker. Not until a diagnosis has been made can the proper rehabilitative procedures be put into action.

The single most important factor in a child's adjustment to a hearing aid is the attitude of the parents. The parents must first accept the diagnosis insofar as it is possible for them to do so. With some parents, acceptance extends over a period of years. With a few others, there may never be acceptance. In all fairness to the child, however, the fitting of a hearing aid should not be delayed indefinitely. It follows that if the parents have really accepted the hearing loss they will accept the instrument which alleviates the handicap. In order to foster acceptance, it is often necessary to see the parents for several counseling sessions. The most satisfactory and economical manner of handling the counseling of most parents is through group orientation sessions.

Parents should be informed regarding hearing in general. They should know something of the anatomy, physiology and pathology of the hearing mechanism. Information should be given them regarding the phycho-acoustics of sound, the various tests used in the assessment of hearing, the use of the audiometer, and the meaning of the audiogram. Demonstrations should be given so that they can obtain some concept of what it is like to have hearing losses of varying types and degrees. Specifically, they should have some understanding of the nature of their child's hearing loss, its relationship to speech and language, and the possible effect of the handicap on the child's general adjustment. Information regarding hearing aids should be given them—their manufacture and operation, proper care for maximum efficiency, their usefulness, and their limitations. They should be told that no hearing impaired individual can obtain normal hearing by using a hearing aid. The disadvantages of unilateral hearing should also be mentioned. Various types of therapeutic procedures should be explained, such as, auditory training, speech correction, speech conservation, speech reading, and language and speech development. Parents should be given the opportunity to bring up and discuss any particular behaviour problems exhibited by their children. These may consist of problems directly related to the hearing loss or to the general area of child development.

An informed parent may not mean an accepting and understanding parent. However, orientation sessions of the type mentioned have been held and the results have been most gratifying. It can now be said that for best results it is wise to delay the selection of a hearing aid for a child until the parents have had sufficient counseling.

The child who is going to wear a hearing aid is in need of a certain amount of counseling and basic information. A child, who is old enough to comprehend, should be told to what degree the hearing aid will be useful to him. He should be told that he will learn to hear many sounds that

he has heretofore been unable to hear, or to hear well. The usefulness of the aid should be demonstrated to him. The child should be questioned regarding his feelings about wearing a hearing aid. If he is resistant, a good deal of counseling may be required. It may be necessary to enlist the cooperation of a psychologist, psychiatrist and social worker.

The child should be given specific information about how a hearing aid is worn, how to insert the earmold, and when a particular instrument has been chosen, how to manipulate the controls and change the batteries and cord. The child who has made a good adjustment to a hearing aid is one who has been allowed to take full responsibility for its care and operation. Naturally, a very young child would be unable to assume complete responsibility, but the average child from five years and upwards usually has no difficulty in this respect.

Auditory training with specific emphasis on sound recognition and discrimination must not be overlooked. The child should be given help in using every bit of hearing to the greatest possible advantage within the limits of his ear to hear.

Ideally, the child's teacher and classmates should be told something of hearing losses and the use of hearing aids. Many parents assume this responsibility. Often the teacher is contacted by letter or by telephone from the rehabilitation center. The attitude of the teacher and the classmates is an important factor in the child's adjustment to his aid. This is particularly true when he is in a regular classroom with hearing children and is probably the only child in the room who is using an aid, and in some instances, the only child in school.

Working with hearing impaired children is truly an interesting and gratifying phase of aural rehabilitation. Children as a rule are flexible and acceptable. The good adjustments made to wearable hearing aids are numerous. A satisfactory adjustment can generally be assured if the parents and the child accept the instrument for what it is—an aid to hearing. A satisfactory adjustment has been made when the child wears the aid spontaneously and without urging for the purpose of obtaining optimum hearing in situations where it is needed.

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[1]*Silverman, S. R., HEARING AND DEAFNESS, A GUIDE FOR LAYMEN, edited by Hallowell Davis. New York: Murray Hill Books, Inc., 1947.*

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Certification Quiz

THE following questions are those which compose part of the examination which you must take to qualify as a certified hearing aid audiologist. Satisfactory responses to these questions will be required of all applicants taking the examination. These questions are published as a help and guide to those who plan to apply for certification. The questions have been supplied to us by the Hearing Center of the University of Pennsylvania.

1A. Describe in a concise manner how to make a pure tone audiometer test—
  a. for air conduction.
  b. for bone conduction.
B. Describe how to interpret the audiogram. Plot a specimen chart to illustrate.
C. How is average normal hearing determined?
D. Describe the threshold for pure tone. For speech.
E. How may hearing loss for speech be measured with same relative precision as that attained with the pure tone test?
F. Explain why this may or may not be accomplished.
2A. Would the average loss as measured by the pure tone audiometer at 500—1000—2000 C.P.S. vary from the hearing loss for speech as measured in decibels by using the two syllable items?
B. What might produce some verified unusual factors in this connection?
3A. What is the purpose of making group audiometer tests?
B. Explain briefly how such a test is made.
4. As related to the study of hearing defects, what is meant by articulation?
5. Is it possible for a person with a severe high tone nerve deafness to have a normal threshold for speech?
6A. Practically what is the most important thing we want to know about an adult's hearing?
B. What test best determines this fact?
C. How do we determine how much loudness through the use of a hearing aid is needed to reach social adequacy?
7A. What is a tolerance test?
B. Why is it advisable to make it?
C. What would you consider the minimum border line hearing loss for speech for social adequacy?
8. Providing you do not use a conventional audiometer, explain in detail what equipment and/or methods you do use to establish the type and degree of hearing loss and how, in fitting a hearing aid. you arrive at the required amount of amplification to establish social adequacy.

THE EAR

9. Describe the external ear.
10. Describe and illustrate the important parts of the auricle.
11. Approximately what is the length of the external audiory canal?
12. What is the middle ear? Describe in detail.
13. Name the ossicles.
14. What is the oval, round window?
15. What is the tympanic cavity?
16. What is the eustachian tube? Where is it and what is its purpose?
17. What does the inner ear consist of.
18. What is the cochlea?
19. What is the purpose of the semi-circular canals?
20. What is the organ of corti? Where located?
21. What is the basiliar membrane? Where located?
22. What does the organ of corti contain?
23. What happens when a sound wave hits the tympanum of a normal ear?
24. Into what three parts is the ear divided?
25. Describe each part and what it contains.
26. What is the name of the so-called "Organ of Hearing?"
27. What diseases or troubles can affect the outer ear?

EAR IMPRESSIONS & EAR MOLDS

28. What type impression material do you use? plaster—plastic
29A. Describe in detail the technique you use in making an ear impression.
B. On what type case would you ask for a short canal? a long canel? a vented ear piece? Explain why.
30. What diseases or troubles can occur to the middle ear?
31. How can you tell if the canal is infected?
32. What diseases or troubles can occur in the inner ear?
33. How often should a deafened person have his hearing checked by a doctor?
34. When a deafened person speaks in a loud voice, what does it signify?
35. What do these symptoms signify? dizziness, loss of balance, uncertain gait.
36. What type of deafness is seen in the child who is born deaf?
37. Should a hearing test be made or an aid tried out before cleaning out a dirty ear?
38. What advice should immediately be given a person with dizziness?
39. Would you advise using an aid on children who are born deaf?
40. Is there any remnant of hearing in these deaf children?
41. What are the common causes of earache?
42. What harm do head noises do?
43. What may be the cause of head noises?
44. What does the technical term "tinnitus" mean?
45. Why is it important to try an aid with a deaf child?
46. Why do children who are born deaf and others who are profoundly deaf, have unnatural voices?
47. What does pain and swelling behind the ear suggest?
48. Why is it desirable for persons wanting a hearing aid, to see a doctor who specializes on the ear?
49. Are dizziness, giddiness, loss of balance and uncertain gait seen in some people with ear trouble?
50. Are there many cases that should be given a bone conduction aid, instead of an air conduction aid?
51. Why has a catarrhally deaf case a soft, low voice?
52. Why do some people say they hear better in the presence of noise?
53. If the noises are mostly of low pitch, why do we want to avoid amplifying them?
54. What is the type of deafness appearing with advancing years?
55. Do the terms, pitch, frequency, vibrations per second, mean the same thing?
56. What should the hearing aid dealer do about the psychology of the hard-of-hearing?
57. Should an amateur attempt to clean out an ear?
58. What is the doctor's explanation of a running ear?
59. What is the range of pitch where hearing is most acute?
60. What is the pitch zone where the sounds of speech lie?
61. To hear speech better, do we want to amplify pitches below
62. What does odor from an ear suggest?
63. What does the continually discharging ear cause?
64. Should a hearing aid be used on a wet or running ear?
65. Will the use of a hearing aid make a person more deaf?
66. Will the use of an aid make a person more nervous?
67. Will a beginner with a hearing aid get improved hearing?
68. Will training and experience with a hearing aid help hearing efficiency.
69. What would be your answer to the complaint that the aid picks up a lot of annoying unwanted noise?
70. How does lip-reading fit into the picture?
71. Can all persons become good or fair lip-readers?
72. What advice should be given the family and friends in order to help a deafened person to read lips better?

NOTE: Inasmuch as these present applicants having been properly sponsored as being now engaged in practicing the art of fitting hearing aids, it is presumed that they know the essentials of instrument (hearing aid) nomenclature and are able to properly demonstrate their respective instruments.

The Ear and Noise

by Howard P. House, M.D., University of Southern California. Reprinted from the proceedings of the third annual National Noise Abatement Symposium.

THE Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology represents the largest organized group of eye, ear, nose, and throat specialists in the world. Its earliest effort was directed toward the prevention of deafness due to disease. To this was added a program of early detection of unsuspected impairment of hearing in school children. As a result, in nearly all schools now audiometric tests are routinely performed on children, and many hearing losses are discovered early enough to be remedied before permanent damage occurs.

Recognizing that a similar situation existed relative to noise, a subcommittee was appointed some four years ago, under the chairmanship of Dr. William Grove, to study this phase of hearing conservation. A practical research program under the direction of our field representative, Dr. Douglas Wheeler, has now been in progress approximately two years. Our conclusions to date are available to any who may wish to have them for reference. Considerably more time will be necessary, however, before many questions pertaining to the medical aspects of this problem can be solved.

In a patient with nerve loss the higher tones are diminished first; consequently he is often unable to hear a telephone bell in another room, and he may notice he hears a man's voice better than the higher-pitched voice of a woman. As the loss progresses, the patient begins to speak louder because he doesn't hear his own voice. Likewise, he begins to speak in a monotone with little modulation. Because low tones are heard better than high tones, noise seems unduly loud and the patient becomes confused in attempting to converse in a noisy environment. Disturbing head noises known as tinnitus may develop, owing to irritative stimuli within the patient's cranium.

In advanced nerve loss, even amplification by means of a hearing aid may not be tolerated, and the individual then must rely largely on his ability to lip-read for conversational purposes.

Clinical examination of these patients fails to reveal any positive physical abnormalities. The ear canal, the eardrum, and the eustachian tube are normal, and yet the patient does not hear.

The diagnosis of nerve impairment from any cause, and there are many, is established by history, by observation of the patient's voice, and by audiometric tests. The underlying exact cause of the nerve impairment, however, is often difficult to determine.

Early nerve damage due to acoustic trauma can be diagnosed, even before the individual himself becomes aware of a hearing loss, by the characteristic bilateral and nearly symmetrical audiometric findings (Chart 1).

When this early audiometric change is noted in a person who works where there is a high noise level, it indicates susceptibility. If adequate protective measures are instituted, further progression can often be prevented. Such measures include the use of ear plugs or ear muffs, which are available commercially. If, in spite of these measures, the hearing curve should continue to recede on subsequent routine periodic audiometric tests, the person should be transferred to a less noisy working environment in the interests of hearing conservation. Unfortunately, once the hearing nerve is damaged, little can be done medically or surgically to restore its function.

If this nerve loss continues and is not detected by periodic audiometric tests, the individual sooner or later becomes aware of his hearing impairment. He has trouble conversing with his wife, and he begins to miss telephone and door bells. He finds it is becoming more difficult for him to converse in a noisy environment, and he begins to avoid social contact.

Audiometric tests at this interval will reveal that the high-tone loss is now encroaching on the conversational frequencies.

If, after reaching this stage, protective measures are not adopted and the individual continues to work in noise of high intensity, the nerve function may recede to a point where even a hearing aid will not be of benefit. He then must be taught to lip-read in order to communicate with his fellow men.

As the nerve loss in acoustic trauma becomes more marked, the findings more closely resemble nerve damage due to other causes.

The differential diagnosis then becomes increasingly

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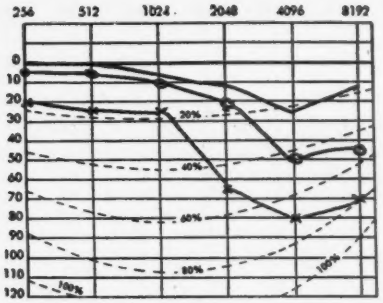

Chart 1.—An audiogram revealing varying degrees of acoustic trauma. The speech frequencies are affected to a considerable degree in the more advanced stage. Note the early slight dip at the frequency of 4,000 cycles per second in both ears, which may progress on further exposure to involve the speech range.

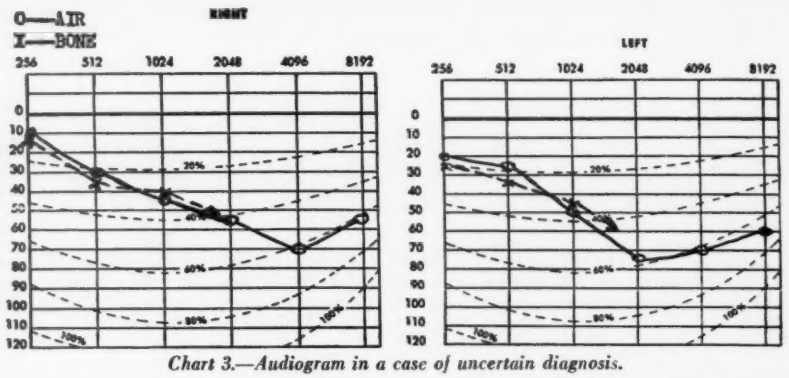

Chart 3.—Audiogram in a case of uncertain diagnosis.

difficult and must include a consideration of long-standing changes in the nerve due either to congenital defects or to defects secondary to childhood disease.

Both of these conditions are nonprogressive, but unless preemployment audiograms are available, the history stated by the patient as to whether or not a hearing loss was present before he was employed in noise often may be the deciding issue in the differential diagnosis.

The following case history illustrates this point:

A 34-year-old man had been aware of head noise for five months since a blast injury. His loss of hearing was detected by a friend and called to the patient's attention three weeks after the blast. The patient had worked in noise for two years. His mother was congenitally deaf. His father had been deaf since 2 years of age, owing to meningitis.

The results of a physical examination were essentially negative except for the characteristic speech of a nerve-deafened patient whose deafness was of long standing.

An audiogram demonstrated advanced nerve loss.

The differential diagnosis included all causes of bilateral nerve loss.

The family history, the patient's characteristic speech, his unawareness of a hearing loss, and his excellent lip-reading ability all indicate a long-standing hearing loss, probably congenital in origin.

In view of the patient's statement concerning normal hearing prior to the last, and since preemployment audiometric records were not available, the diagnosis of acoustic trauma cannot be eliminated.

Causes of advanced nerve loss which is bilateral and progressive include (1) syphilis, (2) chronic toxemias (dental, tonsillar, prostatic), (3) drugs (alcohol, quinine, nicotine, streptomycin, etc.), (4) advanced otosclerosis, (5) senile vascular changes (arteriosclerosis), and (6) others. The following case illustrates this problem:

A man aged 49 had a hearing loss of three months' duration and insidious onset. He had been aware of head noise for three months. He had worked in the presence of a noise level of 120 db these three months.

A physical examination gave essentially negative results.

An audiogram demonstrated advanced nerve loss. A preemployment audiogram made three years before revealed early nerve changes. Periodic audiograms, however, had not been made since his employment.

The differential diagnosis includes syphilis and drugs, which can be readily eliminated. The possibilities then include (1) chronic toxemias (dental, tonsillar, prostatic), (2) advanced otosclerosis, (3) vascular changes (senile), and (4) acoustic trauma.

If the loss were toxic, otosclerotic, or vascular, periodic audiograms would have revealed progression over the original nerve loss noticed on preemployment examination. As the patient stated he had noticed no loss prior to entering the high noise level and no audiograms were made immediately before his entry into this noise, the diagnosis of acoustic trauma cannot be eliminated.

The diagnosis of early hearing loss due to noise is not difficult. Audiometric tests will reveal a characteristic dip in the frequency of 4,000 cycles per second long before the patient becomes aware of any symptoms referable to his ear.

The differential diagnosis of more advanced acoustic trauma, after the patient becomes aware of his hearing loss, is much more difficult.

Therefore, pre-placement and routine periodic follow-up audiograms are essential not only to establish an accurate diagnosis but, much more important, to determine the presence of acoustic trauma at the earliest possible moment in order that adequate protective measures may be instituted.

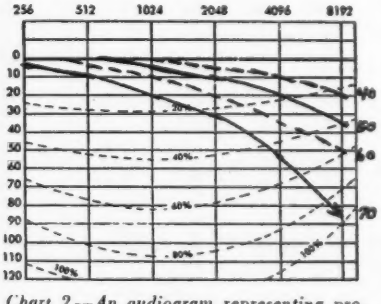

Chart 2.—An audiogram representing progressive nerve loss of senile vascular origin. The ages of the patient corresponding to the successive records are shown at the right.

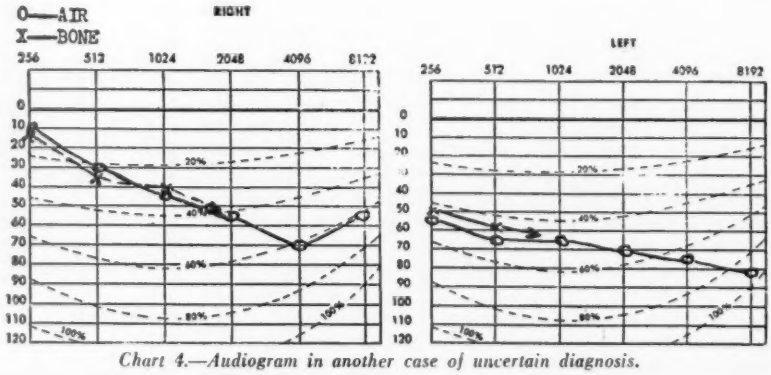

Chart 4.—Audiogram in another case of uncertain diagnosis.

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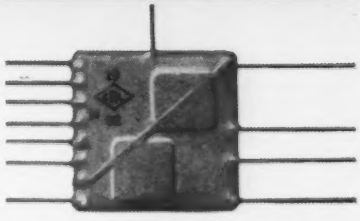

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To All Hearing Aid Manufacturers, Suppliers, Retailers, and Members

ANNUAL IHAA CONVENTION and TRADE SHOW

Sept. 25, 26 and 27, 1953 — Hotel Commodore — New York, N.Y.

Among many of us, it has for some time been felt that the annual convention and trade show of the International Hearing Aid Association could be of the greatest benefit to all concerned were the program and the exhibits designed and executed primarily as a contribution to the education and general enlightenment of the hard-of-hearing public in regard to hearing aids.

Such programs will include exhibiting and demonstrating new products, improvements in existing products, improved instruments, equipment and advanced techniques in evaluating hearing losses and the fitting of hearing aids. Improved practices and techniques in the rehabilitation of the hard-of-hearing with and without the benefit of amplification will be demonstrated. Medical aspects and treatment of deafness, future trends, etc., will be outlined by the authorities in the field of otology.

This year for the first time such a meeting will be held in New York City at the Commodore Hotel, September 25, 26 and 27. Each evening will be devoted to a scientific program with speakers of national importance in their specialties. Manufacturers will be invited to exhibit their products, all of which will be displayed for the public. Where price is shown, retail prices will be used. There will also be a section of scientific exhibits by hospitals, clinics and others in the field of audiology.

Other organizations engaged in service to the hard-of-hearing are invited to participate in this meeting to make it the most informative to which the hard-of-hearing public has even been invited. The meetings will be open to the public from noon through the evening of every day. There will be morning sessions restricted to the trade exclusively.

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Society of Hearing Aid Audiologists

ANNUAL MEETING and SCIENTIFIC PROGRAM

July 26-27-28-29

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Sunday, July 26th

Afternoon—Directors' Early Bird Meeting

Monday, July 27th

Morning—Official Business Meeting paid up members only
Luncheon—Speaker open
Afternoon—Conclude Business Meeting Instruction

Tuesday, July 28th

Morning Session—

9:00-10:00, Subject: Growth & Development of the Ear From Embryo to Adult.
Speaker: Barry J. Anson, M.D., Professor of Anatomy, Northwestern University, College of Medicine.

10:00-11:00, Subject: Anatomical Relationships.
Speaker: E. L. Derlacki, M.D., Northwestern University Medical School.

11:00-12:00, Subject: How The Ear Hears—physiology on analytical basis, supported by colored films.
Speaker: Heinrick G. Kobrak, M.D., University of Chicago, College of Medicine.

Luncheon—Subject: The Cochlea and Its Function in Hearing.
Speaker: Hallowell Davis, M.D. (invited, but not confirmed.)

Afternoon Session—

2:00- 3:00, Subject: What May Happen to the Ear—a summary of diseases of the ear to include traumatic and industrial deafness.
Speaker: John R. Lindsay, M.D., University of Chicago, College of Medicine.

3:00- 4:00, Subject: Treatment of Diseases of the Ear.
Speaker: (open)

4:00- 5:00, Subject: Future Trends in Medical Management of Deafness.
Speaker: (open)

Invited but not confirmed—Albert Fuerstenberg, M.D., Dean Lierle, M.D., Francis Lederer, M.D.

Wednesday, July 29th

Morning Session—

9:00-10:00, Subject: New Testing Methods and Techniques.
Speaker: Raymond Carhart, Phd., Northwestern University Hearing Clinic.

10:00-12:00, Subject: Principles and Practices of Hearing Rehabilitation; Hearing Tests, Children; Hearing Tests, Adults; Auditory Training for Children; Other Phases of Rehabilitation Program for Children and Adults; Rehabilitating the Indigent.
Speaker: Richard Marcus, M.D., University of Illinois, Eye & Ear Hospital, Director of Hearing Clinic.

Luncheon—Subject: Present Trends in Medical Ethics.
Speaker: Representative of the American Medical Association.

Afternoon Session—

2:00. The afternoon session is devoted to the following subjects with speakers to be announced later:
Practical hearing test methods and techniques,
Pure tone and speech audiometry,
Philosophy of rehabilitation through amplification,
The physical and psychological aspects of fitting hearing aids,
Office records: vital statistics—why they should be in every dealer's office, how to keep them, how to use them.

Evening Session—There is a banquet for which a speaker has not yet been determined.
Complete program will be mailed to all members.

Due to illness and the added work load in preparation for his departure May 5 for Europe, Dr. Marcus was unable to supply Part III of his lecture for this issue of the AUDECIBEL which was promised in the January issue.

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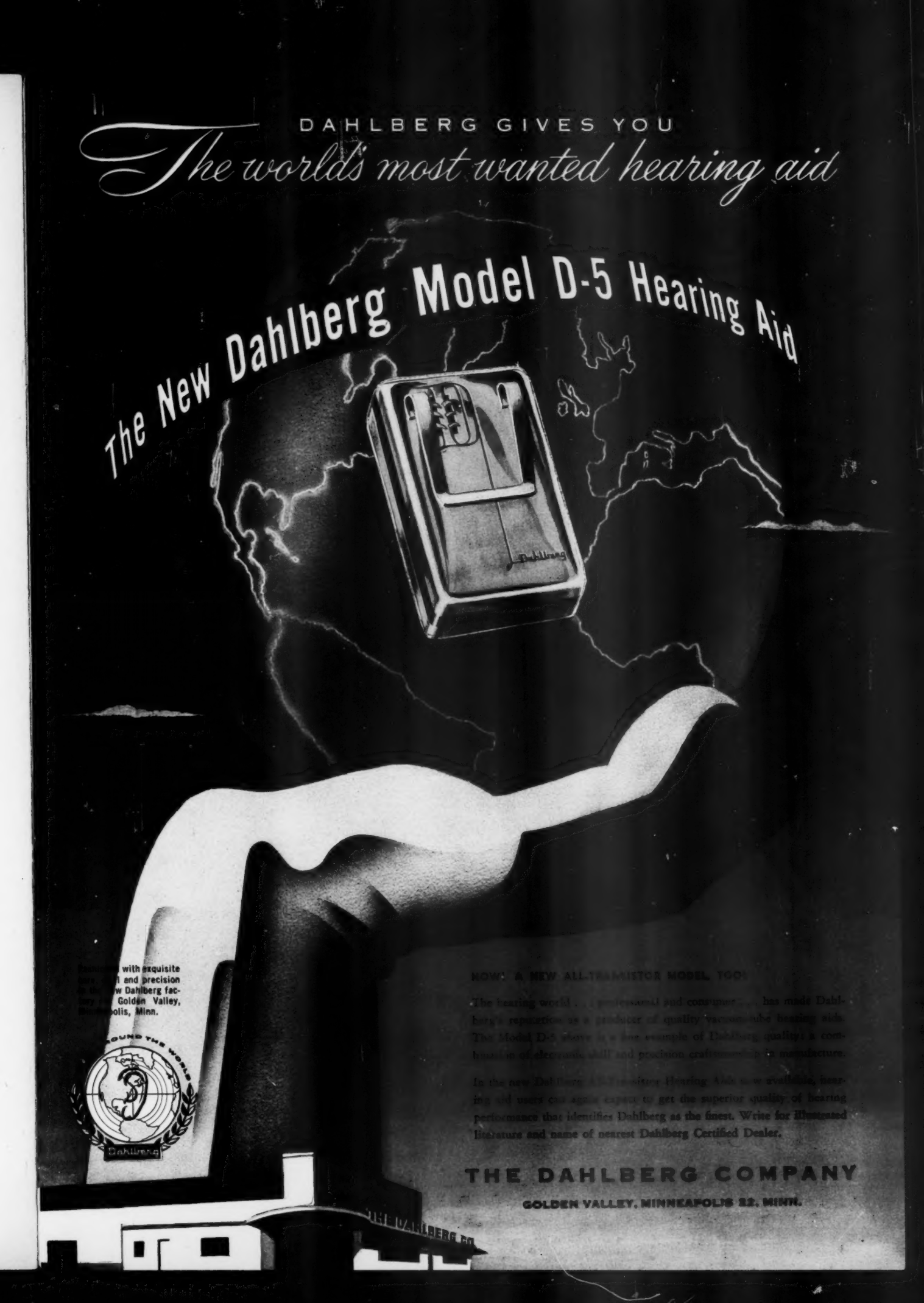

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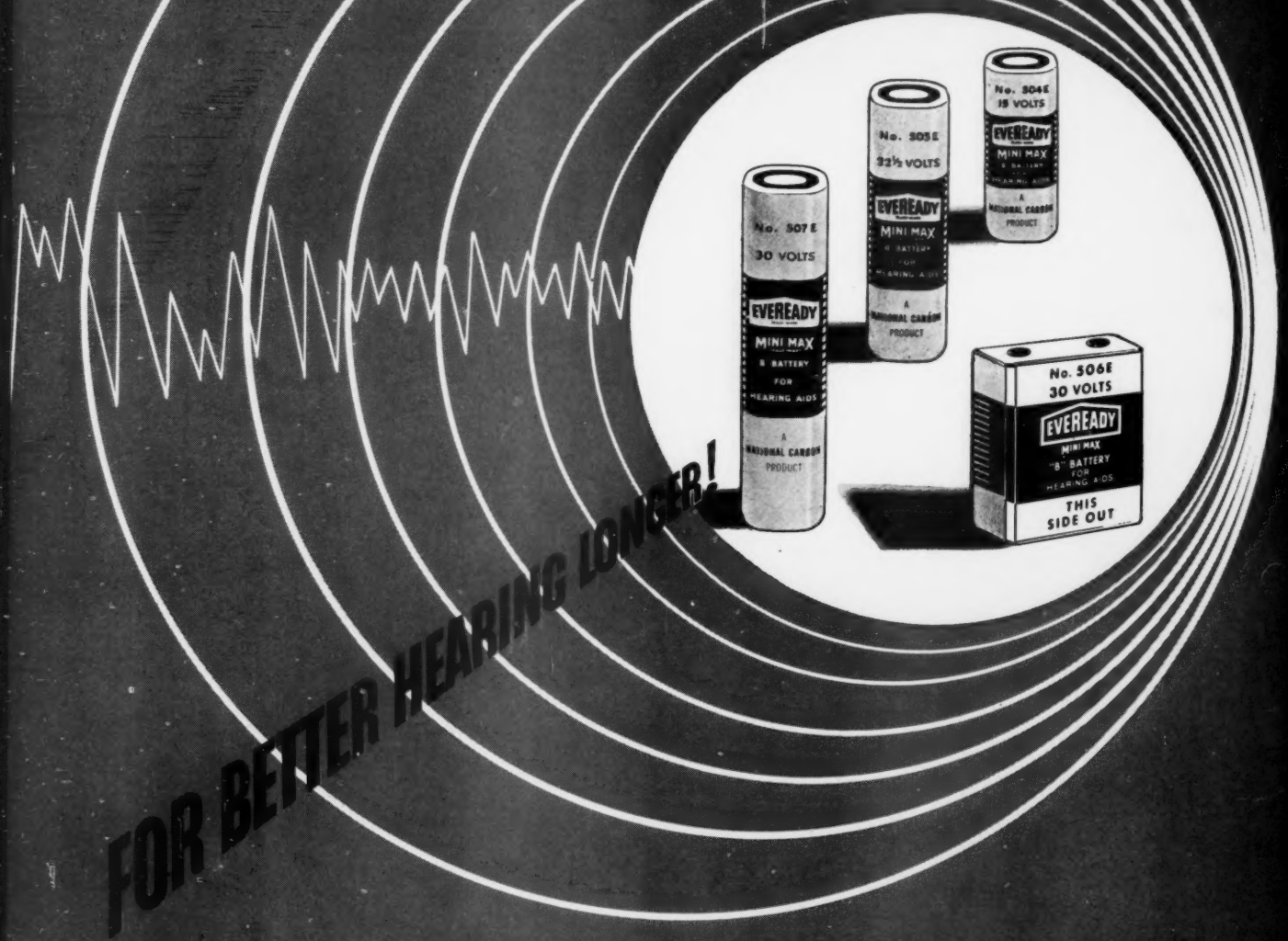
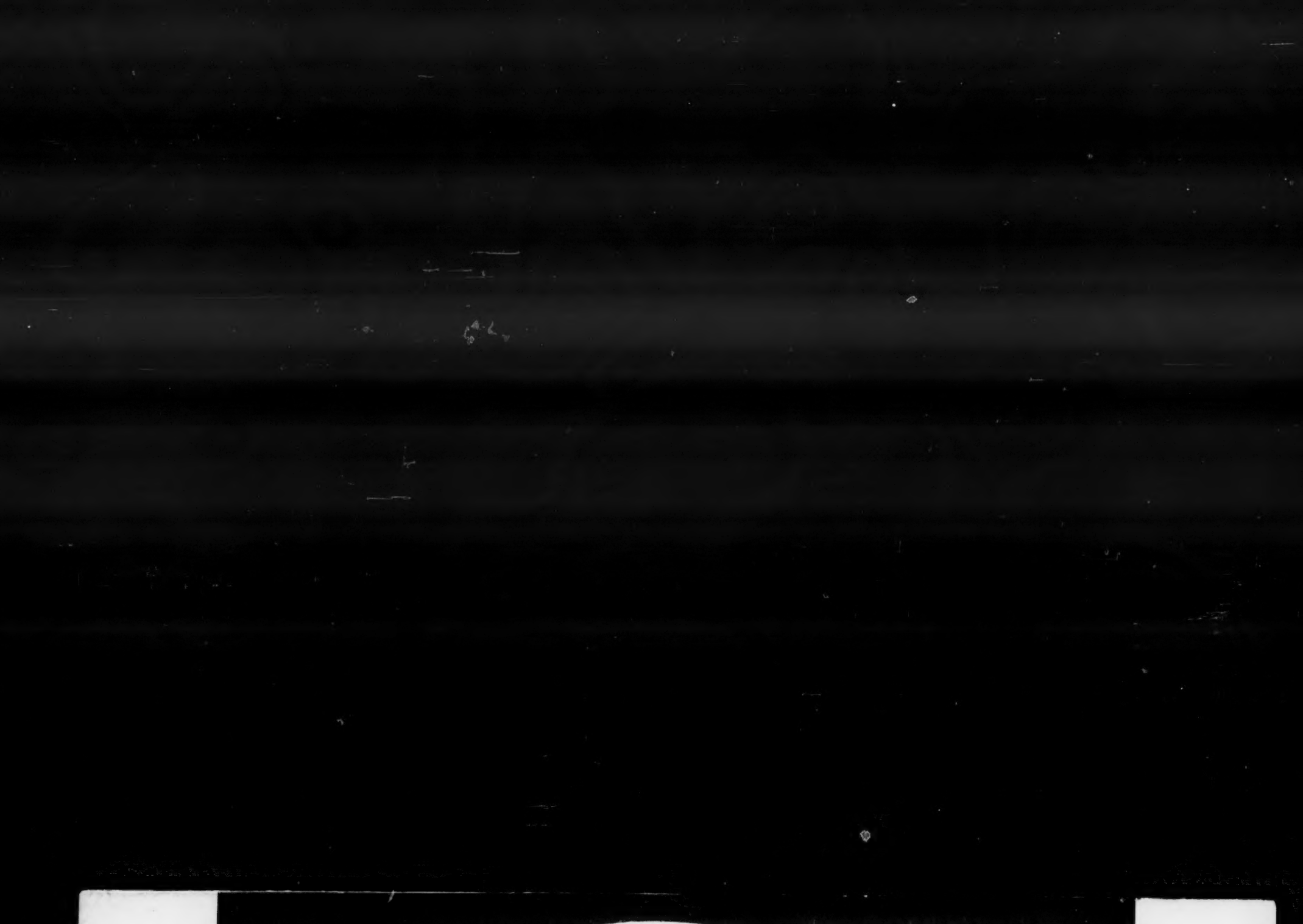
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